THAT WHICH IS CLAIMED:

1. An isolated DNA molecule comprising a sequence selected from the group consisting of:

(a) SEQ ID NO:1;

(b) DNA sequences which encode an enzyme having **SEQ ID NO:2**;

(c) DNA sequences which hybridize to isolated DNA of (a) or (b) above and which encode a quinolate phosphoribosyl transferase enzyme; and

(d) DNA sequences which differ from the DNA of (a), (b) or (c) above due to the degeneracy of the genetic code.

2. A DNA construct comprising an expression cassette, which construct comprises, in the 5' to 3' direction, a promoter operable in a plant cell and a DNA segment according to claim 1 positioned downstream from said promoter and operatively associated therewith.

3. A DNA construct comprising an expression cassette, which construct comprises, in the 5' to 3' direction, a plant promoter and a DNA segment according to claim 1 positioned downstream from said promoter and operatively associated therewith, said DNA segment in antisense orientation.

4. A DNA construct comprising, in the 5' to 3' direction, a promoter operable in a plant cell and DNA encoding a plant quinolate phosphoribosyl transferase, said DNA operably associated with said promoter.

5. A DNA construct comprising, in the 5' to 3' direction, a promoter operable in a plant cell and DNA encoding a plant quinolate phosphoribosyl transferase, said DNA in antisense orientation and operably associated with said promoter.

6. A DNA construct according to claim 2, 3, 4 or 5, which promoter is constitutively active in plant cells.

7. A DNA construct according to claim 2, 3, 4 or 5, wherein said promoter is selectively active in plant root tissue cells.

8. A DNA construct according to claim 2, 3, 4 or 5, wherein said promoter is selectively active in plant root cortex tissue cells.

9. A DNA construct according to claim 2, 3, 4 or 5, wherein said construct further comprises a plasmid.

10. A DNA construct according to claim 2, 3, 4 or 5 carried by a plant transformation vector.

11. A DNA construct according to claim 2, 3, 4 or 5 carried by a plant transformation vector, which plant transformation vector is an *Agrobacterium tumefaciens* vector.

12. A plant cell containing a DNA construct according to claim 2, 3, 4 or 5.

13. A transgenic plant comprising plant cells according to claim 12.

14. A peptide having **SEQ ID NO:2.**

15. A peptide encoded by a DNA sequence selected from the group consisting of:

(a) SEQ ID NO:1;

(b) DNA sequences which hybridize to isolated DNA of (a) above and which encode a quinolate phosphoribosyl transferase enzyme; and

(c) DNA sequences which differ from the DNA of (a) or (b) above due to the degeneracy of the genetic code.

16. A method of making a transgenic plant cell having reduced quinolate phosphoribosyl transferase (QPRTase) expression, said method comprising:

providing a plant cell of a type known to express quinolate phosphoribosyl transferase;

providing an exogenous DNA construct, which construct comprises, in the 5' to 3' direction, a promoter operable in a plant cell and DNA comprising a portion of a sequence encoding quinolate phosphoribosyl transferase mRNA, said DNA operably associated with said promoter; and

transforming said plant cell with said DNA construct to produce transformed cells, said plant cell having reduced expression of QPRTase compared to an untransformed cell.

17. The method of claim 16, wherein said DNA comprising a portion of a sequence encoding quinolate phosphoribosyl transferase mRNA is in antisense orientation.

18. The method of claim 16, wherein said DNA comprising a portion of a sequence encoding quinolate phosphoribosyl transferase mRNA is in sense orientation.

19. The method of claim 16, wherein said plant cell is *Nicotiana tabacum.*

20. The method of claim 16, further comprising regenerating a plant from said transformed plant cell.

21. A method according to claim 16, wherein said promoter is constitutively active.

22. A method according to claim 16, wherein said promoter is selectively active in plant root tissue cells.

23. A method according to claim 16, wherein said promoter is selectively active in plant root cortex tissue cells.

24. A method according to claim 16, wherein said transforming step is carried out by bombarding said plant cell with microparticles carrying said DNA construct

25. A method according to claim 16 wherein said transforming step is carried out by infecting said plant cell with an *Agrobacterium tumefaciens* containing a Ti plasmid carrying said DNA construct.

26. A method of producing transgenic tobacco seeds, comprising collecting seed from a transgenic tobacco plant produced by the method of claim 32.

27. The method according to claim 16, wherein said exogenous DNA sequence is complementary to said quinolate phosphoribosyl transferase messenger RNA (QPRT mRNA) expressed in said plant cell in a region selected from:

(a) the 5'-untranslated sequence of said QPRT mRNA;

(b) the 3'-untranslated sequence of said QPRT mRNA; and

(c) the translated region of said QPRT mRNA.

28. The method according to claim 16, wherein said exogenous DNA sequence is complementary to at least 15 nucleotides of said quinolate phosphoribosyl transferase messenger RNA expressed in said plant cell

29. The method according to claim 16, wherein said exogenous DNA sequence is complementary to at least 200 nucleotides of said quinolate phosphoribosyl transferase messenger RNA expressed in said plant cell

30. The method according to claim 16, wherein said exogenous DNA sequence comprises a quinolate phosphoribosyl transferase encoding sequence selected from the DNA sequences of Claim 1.

31. A transgenic plant of the species *Nicotiana* having reduced quinolate phosphoribosyl transferase (QPRTase) expression relative to a non-transformed control plant, said transgenic plant comprising transgenic plant cells containing:

an exogenous DNA construct comprising, in the 5' to 3' direction, a promoter operable in said plant cell and DNA comprising a segment of a DNA sequence that encodes a

plant quinolate phosphoribosyl transferase mRNA, said DNA operably associated with said promoter;

said plant exhibiting reduced QPRTase expression compared to a non-transformed control plant.

32. The method of claim 31, wherein said segment of DNA comprising a segment of a DNA sequence encoding quinolate phosphoribosyl transferase mRNA is in antisense orientation.

33. The method of claim 31, wherein said segment of DNA comprising a segment of a DNA sequence encoding quinolate phosphoribosyl transferase mRNA is in sense orientation.

34. The method according to claim 31, wherein said DNA comprises a sequence selected from:

(a) the 5'-untranslated sequence of said QPRT mRNA;

(b) the 3'-untranslated sequence of said QPRT mRNA; and

(c) the translated region of said QPRT mRNA.

35. The method according to claim 31, wherein said DNA sequence is at least 15 nucleotides in length.

36. The method according to claim 31, wherein said DNA sequence is at least 200 nucleotides in length.

37. The method according to claim 31, wherein said DNA sequence comprises the quinolate phosphoribosyl transferase encoding sequence of SEQ ID NO:1.

38. The method according to claim 31, wherein said DNA sequence comprises a quinolate phosphoribosyl transferase encoding sequence selected from the DNA sequences of Claim 1.

39. A plant according to claim 31, wherein said promoter is a constitutively active promoter.

40. A plant according to claim 31, wherein said promoter is selectively active in plant root tissue cells.

41. A plant according to claim 31, wherein said promoter is selectively active in plant root cortex tissue cells.

42. A transgenic plant according to claim 31, which plant is *Nicotiana tabacum*.

43. A transgenic plant of the species *Nicotiana* having reduced quinolate phosphoribosyl transferase (QPRTase) expression relative to a non-transformed control plant, wherein said transgenic plant is a progeny of a plant according to claim 31.

44. Seeds of a transgenic plant of the species *Nicotiana* having reduced quinolate phosphoribosyl transferase (QPRTase) expression relative to a non-transformed control plant, wherein said transgenic plant is a plant according to claim 31 or a progeny thereof.

45. A crop comprising a plurality of plants according to claim 31 planted together in an agricultural field.

46. A method for reducing expression of a quinolate phosphoribosyl transferase gene in a plant cell, said method comprising:

growing a plant cell transformed to contain exogenous DNA, wherein a transcribed strand of said exogenous DNA is complementary to quinolate phosphoribosyl transferase mRNA endogenous to said cell, whereby transcription of said complementary strand reduces expression of said quinolate phosphoribosyl gene.

47. The method according to claim 46, wherein said plant cell is *Nicotiana tabacum*.

48. The method according to claim 46, wherein said transformed plant cell is obtained by a method comprising:

integrating into the genome of a host plant cell a construct comprising, in the direction of transcription, a promoter functional in said plant cell, an exogenous DNA sequence wherein a transcribed strand of said exogenous DNA is complementary to quinolate phosphoribosyl transferase mRNA endogenous to said cell, and a transcriptional termination region functional in said cell, whereby a transformed plant cell is obtained.

49. A method according to claim 48, wherein said promoter is constitutively active.

50. A method according to claim 48, wherein said promoter is selectively active in plant root tissue cells.

51. A method according to claim 48, wherein said promoter is selectively active in plant root cortex tissue cells.

52. The method according to claim 46, wherein said transcribed strand of said exogenous DNA sequence is complementary to said endogenous quinolate phosphoribosyl transferase messenger RNA (QPRT mRNA) in a region selected from:

(a) the 5'-untranslated sequence of said endogenous QPRT mRNA;

(b) the 3'-untranslated sequence of said endogenous QPRT mRNA; and

(c) the translated region of said endogenous QPRT mRNA.

53. The method according to claim 46, wherein said transcribed strand of said exogenous DNA sequence is complementary to at least 15 nucleotides of said endogenous quinolate phosphoribosyl transferase messenger RNA.

54. The method according to claim 46, wherein said transcribed strand of said exogenous DNA sequence is complementary to at least 200 nucleotides of said endogenous quinolate phosphoribosyl transferase messenger RNA.

55. The method according to claim 46, wherein said exogenous DNA sequence comprises the quinolate phosphoribosyl transferase encoding sequence of SEQ ID NO:1 in antisense orientation.

56. The method according to claim 46, wherein said exogenous DNA sequence comprises a quinolate phosphoribosyl transferase encoding sequence selected from the DNA sequences of Claim 1, in antisense orientation.

57. A method of producing a tobacco plant having decreased levels of nicotine in leaves of said tobacco plant, said method comprising:

growing a tobacco plant, or progeny plants thereof, wherein said plant comprises cells containing a DNA construct comprising a transcriptional initiation region functional in said plant and an exogenous DNA sequence operably joined to said transcriptional initiation region, wherein a transcribed strand of said DNA sequence is complementary to endogenous quinolate phosphoribosyl transferase messenger RNA in said cells.

58. The method according to claim 57, wherein said exogenous DNA sequence at least 15 base pairs in length.

59. The method according to claim 57, wherein said exogenous DNA sequence is at least 200 base pairs in length.

60. The method according to claim 57, wherein said transcribed strand of said exogenous DNA sequence is complementary to said endogenous quinolate phosphoribosyl transferase messenger RNA (QPRT mRNA) in a region selected from:

(a) the 5'-untranslated sequence of said endogenous QPRT mRNA;

(b) the 3'-untranslated sequence of said endogenous QPRT mRNA; and

(c) the translated region of said endogenous QPRT mRNA.

61. The method according to claim 57, wherein said exogenous DNA sequence comprises the quinolate phosphoribosyl transferase encoding sequence of SEQ ID NO:1 in antisense orientation.

62. The method according to claim 57, wherein said exogenous DNA sequence comprises a quinolate phosphoribosyl transferase encoding sequence selected from the DNA sequences of Claim 1, in antisense orientation.

63. A method of making a transgenic plant cell having increased quinolate phosphoribosyl transferase (QPRTase) expression, said method comprising:

providing a plant cell of a type known to express quinolate phosphoribosyl transferase;

providing an exogenous DNA construct, which construct comprises, in the 5' to 3' direction, a promoter operable in a plant cell and a DNA sequence encoding quinolate phosphoribosyl transferase, said DNA sequence operably associated with said promoter; and

transforming said plant cell with said DNA construct to produce transformed cells, said plant cell having increased expression of QPRTase compared to an untransformed cell.

64. The method of claim 63, wherein said plant cell is *Nicotiana tabacum*.

65. The method of claim 63, further comprising regenerating a plant from said transformed plant cell.

66. A method according to claim 63, wherein said promoter is constitutively active.

67. A method according to claim 63, wherein said promoter is selectively active in plant root tissue cells.

68. A method according to claim 63, wherein said promoter is selectively active in plant root cortex tissue cells.

69. A method according to claim 63, wherein said transforming step is carried out by bombarding said plant cell with microparticles carrying said DNA construct.

70. A method according to claim 63 wherein said transforming step is carried out by infecting said plant cell with an *Agrobacterium tumefaciens* containing a Ti plasmid carrying said DNA construct.

71. A method of producing transgenic tobacco seeds, comprising collecting seed from a transgenic tobacco plant produced by the method of claim 63.

72. The method according to claim 63, wherein said DNA sequence comprises the quinolate phosphoribosyl transferase encoding sequence of SEQ ID NO:1.

73. The method according to claim 63, wherein said exogenous DNA sequence comprises a quinolate phosphoribosyl transferase encoding sequence selected from the DNA sequences of Claim 1.

74. A transgenic plant of the species *Nicotiana* having increased quinolate phosphoribosyl transferase (QPRTase) expression relative to a non-transformed control plant, said transgenic plant comprising transgenic plant cells containing:

an exogenous DNA construct comprising, in the 5' to 3' direction, a promoter operable in said plant cell and a DNA sequence encoding a plant quinolate phosphoribosyl transferase, said DNA operably associated with said promoter;

said plant exhibiting increased QPRTase expression compared to a non-transformed control plant.

75. The method according to claim 74, wherein said DNA sequence comprises the quinolate phosphoribosyl transferase encoding sequence of SEQ ID NO:1.

76. A plant according to claim 74, wherein said promoter is a constitutively active promoter.

77. A plant according to claim 74, wherein said promoter is selectively active in plant root tissue cells.

78. A plant according to claim 74, wherein said promoter is selectively active in plant root cortex tissue cells.

79. A transgenic plant according to claim 74, which plant is *Nicotiana tabacum*.

80. A transgenic plant of the species *Nicotiana* having increased quinolate phosphoribosyl transferase (QPRTase) expression relative to a non-transformed control plant, wherein said transgenic plant is a progeny of a plant according to claim 74.

81. Seeds of a transgenic plant of the species *Nicotiana* having increased quinolate phosphoribosyl transferase (QPRTase) expression relative to a non-transformed control plant, wherein said transgenic plant is a plant according to claim 74 or a progeny thereof.

82. A crop comprising a plurality of plants according to claim 74 planted together in an agricultural field.

83. A method for increasing expression of a quinolate phosphoribosyl transferase gene in a plant cell, said method comprising:

growing a plant cell transformed to contain exogenous DNA, wherein said exogenous DNA encodes quinolate phosphoribosyl transferase.

84. The method according to claim 83, wherein said plant cell is *Nicotiana tabacum*.

85. The method according to claim 83, wherein said transformed plant cell is obtained by a method comprising:

integrating into the genome of a host plant cell a construct comprising, in the direction of transcription, a promoter functional in said plant cell, a DNA sequence encoding quinolate phosphoribosyl transferase functional in said cell, said DNA sequence operably associated with said promoter, and a transcriptional termination region functional in said cell, whereby a transformed plant cell is obtained.

86. A method according to claim 85, wherein said promoter is constitutively active.

87. A method according to claim 85, wherein said promoter is selectively active in plant root tissue cells.

88. A method according to claim 85, wherein said promoter is selectively active in plant root cortex tissue cells:

89. The method according to claim 83, wherein said exogenous DNA sequence comprises the quinolate phosphoribosyl transferase encoding sequence of SEQ ID NO:1.

90. The method according to claim 83, wherein said exogenous DNA sequence comprises a quinolate phosphoribosyl transferase encoding sequence selected from the DNA sequences of Claim 1.

91. A method of producing a tobacco plant having increased levels of nicotine in leaves of said tobacco plant, said method comprising:

growing a tobacco plant, or progeny plants thereof, wherein said plant comprises cells containing a DNA construct comprising a transcriptional initiation region functional in said plant and an exogenous DNA sequence operably joined to said transcriptional initiation region, wherein said DNA sequence encodes quinolate phosphoribosyl transferase functional in said cells.

92. The method according to claim 91, wherein said exogenous DNA sequence comprises the quinolate phosphoribosyl transferase encoding sequence of SEQ ID NO:1.

93. The method according to claim 91, wherein said exogenous DNA sequence comprises a quinolate phosphoribosyl transferase encoding sequence selected from the DNA sequences of Claim 1.